Calhoun County
Fetal and Infant Mortality Review
(FIMR)

2009 Annual Report

Prepared by
Courtney Weathers
Muriel Crow, RNC, WHNP
Calhoun County Public Health Department

Summary

Fetal and Infant Mortality Review (FIMR) is a surveillance methodology used nationwide and in 15 Michigan sites to monitor and understand infant death. The FIMR program serves as an assessment program, a core function of public health practice. Through the regular collection, analysis, and sharing of health data and information about risks and resources in a community, the FIMR program identifies trends in infant mortality and the factors that may be involved. Identifying these trends and their factors is the first step in planning interventions to decrease the Calhoun County infant mortality rate.

In 2009, the Calhoun County FIMR Case Review Team reviewed 14 cases of infant death. Nearly all (85%) of the 2009 reviewed deaths were neonatal deaths - having occurred in the first 28 days of life, with most of the deaths occurring within the first 24 hours of life. Prematurity was associated with the majority (79%) of the cases reviewed. Nearly three-fourths (71%) of the cases reviewed involved an infant with very low birth weight (< 1500 grams). Maternal infections were seen in 50%, maternal tobacco use was found in 50%, and poverty was present in over half (57%) of the cases reviewed.

The review of cases accomplished by the Case Review Team resulted in 19 different recommendations being passed on to the Maternal and Infant Health Commission. Recommendations included improvements in social services and health care systems, and expanding education in regard to preconception and interconception care.

Introduction

Fetal and Infant Mortality Review (FIMR) is a process of identification and analysis of factors that contribute to fetal and infant death through chart review and interview of individual cases. FIMR complements other studies of infant death but uses an approach that is community-based and designed to bring together local health providers, consumers, advocates, and leaders. FIMR identifies strengths and areas for improvement in overall service systems and community resources for women, children, and families. FIMR also provides direction towards the development of new policies to safeguard families.

FIMR has two goals:

- to describe significant social, economic, cultural, safety, health, and systems factors that contribute to mortality, and
- to design and implement community-based action plans founded on the information obtained from the reviews.

Notification (typically through arrival of a death certificate) initiates the case abstraction process. Birth and death certificates, prenatal, hospital, pediatric, EMS, and public health records, and autopsy reports are utilized. A Nurse Practitioner conducts voluntary home interviews with the family to assess the family's needs, provide appropriate referrals, and to obtain the mother's perceptions. This information is de-identified and compiled by the Nurse Practitioner to form a case abstract. The FIMR Case Review Team meets regularly to review completed case abstracts. An issue summary report and a list of policy development and systems change recommendations are completed for each case abstract reviewed.

All information is kept confidential in compliance with HIPAA. Issue summary reports may be shared with the Maternal and Infant Health Commission, the Child Death Review, and other community action groups for consideration and implementation. Case abstract information is sent to Michigan Public Health Institute for surveillance purposes.

The FIMR program serves as an assessment program, a core function of public health practice. Through the regular collection, analysis, and sharing of health data and information about risks and resources in a community, the FIMR program identifies trends in infant mortality and the factors that may be involved. Identifying these trends and their factors is the first step in planning interventions to decrease the Calhoun County infant mortality rate.

FIMR is a surveillance methodology used in 15 Michigan sites (and nationwide) to monitor and understand infant death. Information gained from the FIMR team review, in conjunction with vital statistics data, Pregnancy Risk Assessment Monitoring System (PRAMS), Behavioral Risk Factor Survey (BRFS), Maternal Mortality Review data, and other public health surveillance methods can produce a complex system of information.

Acknowledgement

FIMR was first introduced in Battle Creek in 1991 as one of the eight original national American Congress of Obstetricians and Gynecologists/National Fetal and Infant Mortality Review (ACOG/NFIMR) grantees to implement a three-year FIMR program. Reintroduced in Calhoun County in 1999, FIMR has been revitalized and restored to become an efficiently functioning program and active voice in our community.

As FIMR enters into its 13th straight year of reviewing infant deaths in Calhoun County, recognition must be given to the dedicated group of people who volunteer their time to meet monthly as members of the FIMR Case Review Team. Without their passion and participation, the work of FIMR could not be done.

Calhoun County FIMR Case Review Team, 2009 Cases

- Sara Birch, Oaklawn Hospital
- Cyntheal Cooper, Calhoun County Department of Human Services
- Muriel Crow, FIMR Abstractor/Home Interviewer, Calhoun County Public Health Department
- Genessa Doolittle, FIMR Coordinator, Calhoun County Public Health Department
- Rosemary Fournier, State FIMR Coordinator, Michigan Department of Community Health
- Samuel Grossman, Family Health Center of Battle Creek
- Diana Hazard, Calhoun County Public Health Department
- Summer Liston, Oaklawn Hospital
- Vivien McCurdy, Gentiva Health Services
- Heidi Pengra, Lifespan
- Linda Ratti, Battle Creek Public School Alternative Education
- Kristin Roux, Calhoun County Public Health Department
- Sallie Shears, Summit Pointe

It is also important to pay recognition to those area agencies that support the work of FIMR. Without their support, the work of FIMR would not be possible.

Calhoun County Fetal and Infant Mortality Review Financial Supporters 2009 Cases

- Battle Creek Community Foundation
- Calhoun County Public Health Department
- Michigan Department of Community Health – Maternal Child Health Grant
- Michigan Public Health Institute
- W.K. Kellogg Foundation

2009 FIMR Data

Table 1 details the progress of Calhoun County FIMR over the last three years. Cases not reviewed by Calhoun County FIMR are reviewed by the Calhoun County Child Death Review Team, coordinated by Calhoun County Department of Human Services.

Table 1: Calhoun County Infant Mortality and FIMR Case Review

	2007	2008	2009
Total Infant Deaths[1]	28	15	21
FIMR CRT Reviews	25	14	14

Calhoun County continues to see a disparity in infant mortality rates between Caucasians and African Americans. The three-year (2006-2008) age infant rate was three times higher for African Americans (25.2)[2] than Whites (8.5)[3].

Table 2: Calhoun County African American Infant Mortality

	2007	2008	2009
African American Infant Deaths	10	3	5
Percent of Infant Deaths that were African American[4]	36%	20%	36%

Table 3: Causes of Death (as listed on death certificates), 2009

- Extreme Prematurity
- Hypoxic Ischemic Encephalopathy
- Multisystem Organ Failure, Ornithine Transcarbamylase Deficiency
- Prematurity
- Severe Prematurity
- Perinatal Asphyxia
- Pre-Term Labor
- Purkinjie Cell Haratoma
- Pulmonary Hypertension
- Premature Ruptured Membranes
- Hypoplastic Left Heart Syndrome
- Complication of Complex Heart Disease
- Complex Cardiac Abnormalities
- Hyaline Membrane Disease
- Sudden Unexplained Infant Death (reviewed by Calhoun County Child Death Review)

1. 2006 – 2007 State official totals: 1989-2007 Michigan Resident Death Files and Michigan Resident Birth Files, Epidemiology Services Division, Vital Records and Health Data Development Section, Michigan Department of Community Health.
2. 1995- 2007 Michigan Resident Death Files and Michigan Resident Birth Files, Vital Records & Health Data Development Section, Michigan Department of Community Health.
3. 1995- 2007 Michigan Resident Death Files and Michigan Resident Birth Files, Vital Records & Health Data Development Section, Michigan Department of Community Health.
4. Race reported on death certificates received by Calhoun County Public Health Department.

Table 4 shows the number of cases reviewed by gestational age. The age of viability, the point at which a fetus has some chance of surviving outside the mother if born prematurely, is viewed by many experts as being between 22 and 25 weeks of gestation.

According to a report released by the March of Dimes in March 2009, the average medical costs for the first year of life of an infant born healthy and full-term is approximately $4,500. The average medical costs for the first year of life of an infant born prematurely and/or with low birth weight (less than 37 weeks gestation and/or less than 2,500 grams) are approximately $49,000[1]. Nearly half of the births in Calhoun County over the last five years have been Medicaid-paid births[2].

Table 4: Gestational Age at Birth, 2009 Infant Deaths

N = 14	Total	Percent
≤ 20 weeks	4	29%
21-23 weeks	5	36%
24 – 27 weeks	3	21%
28 – 31 weeks	2	14%
32 – 36 weeks	1	7%
37 + weeks	1	7%

Table 5: Age of Infant at Time of Death, 2009 Infant Deaths

N = 14	Total	Percent
≤ 24 hours	8	57%
1 – 7 days	5	36%
8 – 28 days	1	7%

Table 6: Birth weight, 2009 Infant Deaths

N = 14	Total	Percent
Unknown	2	14%
Very Low Birth weight (751 – 1500 grams)	10	71%
Moderate Low Birth weight (1501 – 2499 grams)	1	7%
Normal Birth weight (>2500 grams)	1	7%

1. March of Dimes Foundation. (2008). The Cost of Prematurity to Employers. Retrieved from http://marchofdimes.com/peristats/pdfdocs/cts/ThomsonAnalysis2008_SummaryDocument_final121208.pdf
2. Annie E. Casey Foundation (2009). Kids Count Data Center: Profile for Calhoun County. Michigan League for Human Services.

Tables 7 and 8 include demographic information regarding the mothers of the infants that died in 2009.

Table 7: Age of Mother at Time of Birth, 2009 Infant Deaths

N = 14	Total	Percent
≤ 18 years	1	7%
19 – 22 years	4	29%
23 – 26 years	5	36%
27 – 30 years	1	7%
31 – 34 years	1	7%
≥ 35 years	2	14%

Table 8: Education Attained by Mother, 2009 Infant Deaths

N = 14	Total	Percent
> 12th grade	1	8%
High School Graduate or GED Completed	6	46%
Some College Credit, But No Degree	3	23%
Associates Degree	2	8%
Bachelors Degree	2	15%

The FIMR Case Review Team (CRT) reviews the case abstracts at monthly meetings. From this review of the data, the CRT identifies factors that were present in each of the cases. Tables 9 through 13 include selected information[1] taken from the issue summary reports completed for each case reviewed. The first column lists the factors included on issue summary reports. The second column lists the number of cases that were found to have the factor present. The third column lists the percentage of cases found to have this factor.

Table 9: Maternal Risk Factors, Medical

N = 14	Present	Percent
Chorioamnionitis	6	43%
Infection	7	50%
Sexually Transmitted Infection	6	43%
Obese	2	14%
Insufficient Weight Gain	2	14%

Due to missing height measurements for many of the cases, it was impossible for the CRT to determine obesity for those cases. However, the CRT strongly suspects that the Maternal Risk Factor of Obesity as reported here is artificially low. Had the CRT been able to calculate Body Mass Index for all of the reviewed cases, it is strongly believed that the factor of obesity and would be present in a much larger percentage of cases.

1. Report includes all factors that were present in at least 2 (14%) of the 2009 cases reviewed.

Table 10: Maternal Risk Factors, Previous Poor Birth Outcomes

N = 14	Present	Percent
Spontaneous Abortion (miscarriage)	2	14%
Previous Preterm Delivery	2	14%
Previous Low Birth Weight	2	14%

Table 11: Maternal Risk Factors, Mental Health

N = 14	Present	Percent
Maternal History of Mental Illness	3	21%

Table 12: Maternal Risk Factors, Behavioral

N = 14	Present	Percent
Tobacco	7	50%
Inadequate Prenatal Care	2	14%
Intended Pregnancy	2	14%

Table 13: Maternal Risk Factors, Psychosocial

N = 14	Present	Percent
Single Parent	6	43%
Multiple Stressors	4	28%
Poverty Present (Medicaid)	8	57%

Table 11 shows the percentage of cases in 2006, 2007, 2008, and 2009 with select factors.

Table 14: Selected Factors, 2006-2009

	2006	2007	2008	2009
Extreme Prematurity (< 28 weeks)	56%	65%	79%	71%
Low Birth Weight (< 2500 grams)	64%	74%	86%	86%
Maternal Tobacco Use	43%	39%	46%	50%
Late Entry to Prenatal Care	21%	26%	7%	14%
Overweight/Obese	14%	43%	23%	14%

FIMR Recommendations

After reviewing the data and identifying the factors present, the CRT develops recommendations for the Maternal and Infant Health Commission. Below are the CRT recommendations formed in response to the 14 infant deaths reviewed in 2009.

Multiple Recommendations

Counseling and education with patients using Assisted Reproductive Technology. (2)

Other Recommendations

Earlier identification of infections for women during pregnancy. Educate women about the signs of infections.

Ensure that intense services are provided for high-risk women. Earlier GTT (glucose tolerance testing) for high-risk women. Routine genetic testing for high-risk women.

Access to preventative health care preconception to minimize known risk factors for poor pregnancy outcomes. Improved access to prenatal care for women during pregnancy. More emphasis on interconception care for women.

Need for standardized intake forms for women. Prepare excellent documentation and coordination of care for women.

Need ability/resource to refer families to a mentor/support services in situations where mother receives a referral for high-risk services. Provide a navigator to assist women in high-risk pregnancies in difficult or confusing medical situations.

- Better verbal communication between providers and patients
- Ensure that women are up to date on vaccinations.
- Provide extra support for women perinatal and postpartum when there is a negative outcome expected.
- Perform routine drug screening for all women meeting the criteria for the screen.
- All women need to have a medical home where they receive prenatal care during their pregnancy.
- Consult with neonatology prior to labor to discuss viability/resuscitation efforts for preterm infants.

Questions to be Addressed

Are appropriate questions about infection being asked?